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L2 1 SEA FILE=REGISTRY ABB=ON PLU=ON PALLADIUM/CN
 L3 5 SEA FILE=REGISTRY ABB=ON PLU=ON (1314-13-2 AND
 7440-05-3)/CRN

 L4 103 SEA FILE=REGISTRY ABB=ON PLU=ON (ZN(L)O(L)PD)/ELS
 L5 7 SEA FILE=REGISTRY ABB=ON PLU=ON (L3 OR L4) AND 3/ELC.SUB
 L6 111 SEA FILE=REGISTRY ABB=ON PLU=ON (ZN(L)O)/ELS AND
 2/ELC.SUB
 L7 1 SEA FILE=CAPLUS ABB=ON PLU=ON L3/CAT OR L5/CAT
 L8 1409 SEA FILE=CAPLUS ABB=ON PLU=ON L6 AND L2
 L9 690 SEA FILE=CAPLUS ABB=ON PLU=ON L8 AND CAT/RL
 L10 691 SEA FILE=CAPLUS ABB=ON PLU=ON L7 OR L9
 L11 53782 SEA FILE=CAPLUS ABB=ON PLU=ON PORE(2A) (SIZE OR VOLUME OR
 MICRON OR MU)
 L12 10 SEA FILE=CAPLUS ABB=ON PLU=ON L10 AND L11
 L13 1 SEA FILE=REGISTRY ABB=ON PLU=ON RUTHENIUM/CN
 L14 1 SEA FILE=REGISTRY ABB=ON PLU=ON CERIUM/CN
 L15 1 SEA FILE=REGISTRY ABB=ON PLU=ON ZIRCONIA/CN
 L16 1 SEA FILE=REGISTRY ABB=ON PLU=ON ALUMINA/CN
 L17 4 SEA FILE=REGISTRY ABB=ON PLU=ON (7440-05-3 OR
 7440-18-8)/CRN
 AND 7440-45-1/CRN AND (1314-23-4 OR 1344-28-1)/CRN.
 L18 3 SEA FILE=REGISTRY ABB=ON PLU=ON ((PD OR RU) (L)CE (L) (ZR
 OR
 AL) (L)O)/ELS AND 4/ELC.SUB
 L19 7 SEA FILE=REGISTRY ABB=ON PLU=ON L17 OR L18
 L20 2 SEA FILE=CAPLUS ABB=ON PLU=ON L19/CAT
 L21 462 SEA FILE=CAPLUS ABB=ON PLU=ON (L13 OR L2) AND L14 AND
 (L15
 OR L16) AND CAT/RL
 L22 377 SEA FILE=CAPLUS ABB=ON PLU=ON CERIUM(2A) PROMOT?
 L23 14 SEA FILE=CAPLUS ABB=ON PLU=ON L21 AND L22
 L24 84 SEA FILE=CAPLUS ABB=ON PLU=ON (L13 OR L2 OR RU OR PD OR
 RUTHENIUM OR PALLADIUM) (L) (CERIUM OR CE OR L14) (L) (L15 OR
 ZRO?
 OR ZIRCONIA OR AL2O3 OR ALUMINA OR L16) (L) PROMOT? AND
 CAT/RL
 L25 11 SEA FILE=CAPLUS ABB=ON PLU=ON
 (PALLADIUM-RUTHENIUM) (L) (ZIRCON
 IA OR ALUMINA OR ZRO? OR AL2O3) AND CAT/RL
 L26 116 SEA FILE=CAPLUS ABB=ON PLU=ON L12 OR L20 OR L24 OR L23
 OR
 L25
 L27 8937 SEA FILE=CAPLUS ABB=ON PLU=ON (STEAM OR WATER(2A) GAS OR

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8/10/2004

L28 WATER (2A) VAPOR) (2A) REFORMING OR HYDROFORMING
53 SEA FILE=CAPLUS ABB=ON PLU=ON (METHYL OR ETHYL OR PROPYL
OR
ISOPROPYL OR BUTYL OR ISOBUTYL OR T-BUTYL) (L) (ALCOHOL OR
ALC) (L) REFORMING OR METHAFORMING
L29 2377 SEA FILE=CAPLUS ABB=ON PLU=ON (METHANOL OR ETHANOL OR
PROPANOL OR ISOPROPANOL OR BUTANOL OR ISOBUTANOL OR
T-BUTANOL
OR MEOH OR ETOH OR PROH OR I-PROH OR BUOH OR I-BUOH OR
T-BUOH) (L) (REFORMING)
L30 6 SEA FILE=CAPLUS ABB=ON PLU=ON (L27 OR L28 OR L29) AND
L26

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L30 ANSWER 1 OF 6 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:697712 CAPLUS
DOCUMENT NUMBER: 140:114038
TITLE: CeO₂-Al₂O₃-supported noble metal catalysts for
steam reforming of hydrocarbons for
fuel cells
AUTHOR(S): Zheng, Jian; Strohm, James Jon; Song, Chunshan
CORPORATE SOURCE: Clean Fuels and Catalysis Program, The Energy
Institute, and Department of Energy &
Geo-Environmental Engineering, Pennsylvania State
University, University Park, PA, 16802, USA
SOURCE: Preprints of Symposia - American Chemical Society,
Division of Fuel Chemistry (2003), 48(2), 743-745
CODEN: PSADFZ; ISSN: 1521-4648
PUBLISHER: American Chemical Society, Division of Fuel
Chemistry
DOCUMENT TYPE: Journal; (computer optical disk)
LANGUAGE: English
AB Various metals (Rh, Ru, Ir, Pt, Pd, Ni) supported on
CeO₂-promoted Al₂O₃ were studied for **steam**
reforming of liq. hydrocarbons such as jet fuel. At higher
temps., .apprx.800°, Ir/CeO₂-Al₂O₃ catalyst showed the
highest activity for **steam reforming** of lower
hydrocarbons among all the the CeO₂-Al₂O₃ supported noble metal
catalysts. However, at lower temps., .apprx.500°, Ir lost its
superiority to Rh and Ru. **Ce promoted the**
steam reforming of hydrocarbons by improving the
activity and coke resistance of Rh and Ir supported catalysts.
CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)

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Section cross-reference(s): 67

ST ceria alumina noble metal catalyst hydrocarbon **steam reforming**; fuel cell hydrocarbon catalytic **steam reforming**

IT Alkanes, uses
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process);

USES (Uses)
(C12-14; noble metal catalysts supported on ceria-promoted alumina for **steam reforming** of liq. hydrocarbons for fuel cells)

IT Hydrocarbons, uses
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process);

USES (Uses)
(liq.; noble metal catalysts supported on ceria-promoted alumina for **steam reforming** of liq. hydrocarbons for fuel cells)

IT Fuel cells
Jet aircraft fuel
Steam reforming catalysts
(noble metal catalysts supported on ceria-promoted alumina for **steam reforming** of liq. hydrocarbons for fuel cells)

IT Noble metals
RL: CAT (Catalyst use); USES (Uses)
(noble metal catalysts supported on ceria-promoted alumina for **steam reforming** of liq. hydrocarbons for fuel cells)

IT 1306-38-3, Cerium dioxide, uses 1344-28-1, Alumina, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst support; noble metal catalysts supported on ceria-promoted alumina for **steam reforming** of liq. hydrocarbons for fuel cells)

IT 7439-88-5, Iridium, uses 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses
RL: CAT (Catalyst use); USES (Uses)
(noble metal catalysts supported on ceria-promoted alumina for **steam reforming** of liq. hydrocarbons for fuel cells)

REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS

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RECORD. ALL CITATIONS AVAILABLE IN THE RE

FORMAT

L30 ANSWER 2 OF 6 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:814702 CAPLUS

DOCUMENT NUMBER: 137:313542

TITLE: Integrated fuel processor, fuel cell stack, and
tailINVENTOR(S): gas oxidizer with carbon dioxide removal
Stevens, James F.

PATENT ASSIGNEE(S): Texaco Inc., USA

SOURCE: U.S. Pat. Appl. Publ., 14 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2002155329	A1	20021024	US 2002-126679	20020418
US 6682838	B2	20040127		
WO 2002085783	A2	20021031	WO 2002-US12368	20020418
WO 2002085783	A3	20021212		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

EP 1390292 A2 20040225 EP 2002-764238 20020418

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

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NO 2003004656 A 20031017 NO 2003-4656 20031017
PRIORITY APPLN. INFO.: US 2001-284684P P
20010418 WO 2002-US12368 W
20020418
AB An illustrative method for converting hydrocarbon fuel to hydrogen
rich gas, includes the steps of: reacting the hydrocarbon fuel with steam
in the presence of reforming catalyst and a carbon dioxide fixing
material to produce a first hydrogen gas; and removing carbon monoxide from the
first hydrogen gas to produce the hydrogen rich gas, wherein the removing
step utilizes a process selected from methanation or selective oxidn. In
one illustrative embodiment the carbon dioxide fixing material is selected
from calcium oxide, calcium hydroxide, strontium oxide, strontium
hydroxide, and/or minerals. The reforming catalyst in one preferred
and illustrative embodiment is selected from nickel, platinum, rhodium,
palladium, ruthenium, or similar supported reforming
catalysts or combinations of these. In such instances the reforming
catalyst is preferably supported on a high surface area support thus
promoting the reforming reaction and more preferably is selected from
alumina, titania, zirconia, or similar such compds. or
combinations of these. It is preferred that in one illustrative
embodiment that the temp. of the reacting step is from about 400°
to about 800°.
IC ICM H01M008-06
ICS C01B003-34
NCL 429017000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 53
IT Exhaust gases (engine)
Fuel cells
 Steam reforming catalysts
Waste gases
 (integrated fuel processor, fuel cell stack, and tail gas oxidizer
with carbon dioxide removal)
IT Fuel gas manufacturing
 (**steam reforming**; integrated fuel processor, fuel
 cell stack, and tail gas oxidizer with carbon dioxide removal)

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IT 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4,
Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses
RL: **CAT (Catalyst use)**; USES (Uses)
(integrated fuel processor, fuel cell stack, and tail gas oxidizer
with carbon dioxide removal)
IT 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses 13463-67-7,
Titania, uses
RL: **CAT (Catalyst use)**; USES (Uses)
(support; integrated fuel processor, fuel cell stack, and tail gas
oxidizer with carbon dioxide removal)

L30 ANSWER 3 OF 6 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:64236 CAPLUS

DOCUMENT NUMBER: 136:91503

TITLE: Copper-free and non-noble metal catalyst for
preparing

hydrogen by oxidizing and **reforming**
methanol

INVENTOR(S):
Shufeng;

Hong, Xuelun; Wu, Diyong; Wang, Shudong; Liu,

PATENT ASSIGNEE(S):
of

Zhang, Peng; Qi, Aidu
Dalian Inst. of Chemical Physics, Chinese Academy
Sciences, Peop. Rep. China

SOURCE:

Faming Zhuanli Shenqing Gongkai Shuomingshu, 5 pp.
CODEN: CNXXEV

DOCUMENT TYPE:

Patent

LANGUAGE:

Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
CN 1305867	A	20010801	CN 2000-110040	20000119
			CN 2000-110040	

PRIORITY APPLN. INFO.:
20000119

AB The catalyst is composed of active components from two of V, Cr, Mn,
Zn,
Mo, Fe, Co, Ni and **Ru**, **promoters** from one or more of
La, **Ce** and Y 1-10%, and an addnl. carrier 1-90%. The carrier is
selected from one of SiO₂, ZrO₂ and Al₂O₃. The
catalyst has high activity, selectivity, and stability for synthesis
of
hydrogen by oxidizing and **reforming methanol**.

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IC ICM B01J023-16
ICS B01J023-74; B01J023-76
CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 49
ST **reforming** oxidizing catalyst transition metal silica alumina
methanol hydrogen; zirconium oxide transition metal
reforming oxidizing catalyst **methanol** hydrogen
IT Oxidation catalysts
Reforming catalysts
(Copper-free and non-noble metal catalyst for prepg. hydrogen by
oxidizing and **reforming methanol**)
IT 1314-23-4, Zirconium oxide (ZrO₂), uses 1344-28-1, Alumina, uses
7439-89-6, Iron, uses 7439-91-0, Lanthanum, uses 7439-96-5,
Manganese,
uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses
7440-45-1,
Cerium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses
7440-62-2, Vanadium, uses 7440-65-5, Yttrium, uses 7440-66-6,
Zinc,
uses 7631-86-9, Silica, uses
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or
reagent); USES (Uses)
(Copper-free and non-noble metal catalyst for prepg. hydrogen by
oxidizing and **reforming methanol**)
IT 67-56-1, **Methanol**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(Copper-free and non-noble metal catalyst for prepg. hydrogen by
oxidizing and **reforming methanol**)
IT 1333-74-0P, Hydrogen, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(Copper-free and non-noble metal catalyst for prepg. hydrogen by
oxidizing and **reforming methanol**)

L30 ANSWER 4 OF 6 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2001:731312 CAPLUS
DOCUMENT NUMBER: 135:290842
TITLE: Reforming catalysts and methods of alcohol
steam reforming
INVENTOR(S): Wang, Yong; Tonkovich, Anna Lee Y.; Hu, Jianle
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 13 pp., Cont.-in-part of
U.S.
Ser. No. 640,903.
CODEN: USXXCO
DOCUMENT TYPE: Patent

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LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 9
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2001026782	A1	20011004	US 2001-788294	20010216
US 6488838	B1	20021203	US 1999-375614	19990817
US 6680044	B1	20040120	US 2000-640903	20000816
WO 2002066370	A2	20020829	WO 2002-US4527	20020215
WO 2002066370	A3	20030403		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, BR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.:
 19990817 US 1999-375614 A2
 20000816 US 2000-640903 A2
 20010216 US 2001-788294 A
 20020213 US 2002-76881 A

AB H is manufd. by **steam-reforming MeOH** over a porous catalyst contg. Pd and(or) Ru on ZnO, Al₂O₃, or ZrO₂, optionally doped with Ce, having ≥20% pores with size 0.1-300 μm at ≥1 1.5 mol MeOH/g catalyst h. This process is useful in fuel cells.

IC ICM B01J008-02
 NCL 422211000
 CC 49-1 (Industrial Inorganic Chemicals)

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Section cross-reference(s): 52, 67

ST **steam reforming catalyst methanol palladium**
zinc oxide; fuel cell hydrogen manuf **steam reforming**
catalyst; cerium zirconia **steam reforming catalyst**
methanol; ruthenium alumina **steam reforming**
catalyst **methanol**

IT **Steam reforming**
Steam reforming catalysts
Synthesis gas manufacturing
(**reforming catalysts for steam reforming**
of **methanol** in manuf. of hydrogen)

IT Fuel cells
Steam
(**reforming catalysts for steam reforming**
of **methanol** in manuf. of hydrogen for fuel cells)

IT 1314-13-2, Zinc oxide, uses 1314-23-4, Zirconia, uses
1344-28-1, Alumina, uses
RL: CAT (Catalyst use); USES (Uses)
(**reforming catalysts for steam reforming**
of **methanol** in manuf. of hydrogen)

IT 7440-05-3P, Palladium, preparation 7440-18-8P, Ruthenium,
preparation 12014-74-3P, Cerium oxide (CeO)
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)
(**reforming catalysts for steam reforming**
of **methanol** in manuf. of hydrogen)

IT 1333-74-0P, Hydrogen, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(**reforming catalysts for steam reforming**
of **methanol** in manuf. of hydrogen)

IT 67-56-1, **Methanol**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(**reforming catalysts for steam reforming**
of **methanol** in manuf. of hydrogen)

IT 7732-18-5, Water, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(**reforming catalysts for steam reforming**
of **methanol** in manuf. of hydrogen for fuel cells)

L30 ANSWER 5 OF 6 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2000:815115 CAPLUS
DOCUMENT NUMBER: 133:352477
TITLE: Catalyst for synthesis gas manufacturing from
methanol reforming
INVENTOR(S): Hayakawa, Takashi; Suzuki, Kunio; Hamakawa,
Satoshi;

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PATENT ASSIGNEE(S): Murata, Kazuhisa; Shima, Yoshitaka; Ishii, Tomoko;
 Japan; Kumagaya, Mikio
 Agency of Industrial Sciences and Technology,
 Sangyo Sozo Kenkyusho K. K.
 SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000317308	A2	20001121	JP 1999-119519	19990427
JP 3243495	B2	20020107		
			JP 1999-60497	A

PRIORITY APPLN. INFO.:
 19990308

AB The **reforming** catalyst for decomp. MeOH to produce CO/H₂ mixed gases comprises (i) Ce/Pd/Zr composite metal oxides of formula: Ce_{1-x-y}Pd_xZr_yO_{2-x·m}H₂O (x = 0.05-0.7; y = 0.05-0.8; m = 0-10), and (ii) hydrogenation treatment products of the composite metal

oxides, by redn. with H₂ at 200-600° under H₂ pressure 0.05-1.5 atm. for 60-240 min to convert Pd oxides into elemental Pd. The catalyst

is durable and and effective for decomp. MeOH to produce synthesis gas mainly contg. CO and H₂.

IC ICM B01J023-63
 ICS C01B003-40

CC 51-9 (Fossil Fuels, Derivatives, and Related Products)
 Section cross-reference(s): 67

ST catalyst synthesis gas manufg **methanol reforming**;
 cerium palladium zirconium oxide catalyst **methanol reforming**

IT **Reforming** catalysts
 (Ce/Pd/Zr composite metal oxides-based; for synthesis gas manufg. from

methanol reforming)

IT Synthesis gas manufacturing
 (catalyst for synthesis gas manufg. from **methanol reforming**)

IT 92068-66-1 **306769-57-3**, Cerium palladium zirconium oxide (Ce_{0.6}Pd_{0.25}Zr_{0.15}O_{1.75}) **306769-58-4**, Cerium palladium zirconium oxide (Ce_{0.7}Pd_{0.15}Zr_{0.15}O_{1.85}) **306769-59-5** **306769-60-8**
306769-62-0

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RL: CAT (Catalyst use); USES (Uses)
 (catalyst for synthesis gas manufg. from **methanol**
reforming)

IT 630-08-0P, Carbon monoxide, preparation 1333-74-0P, Hydrogen,
 preparation

RL: IMF (Industrial manufacture); PEP (Physical, engineering or
 chemical

process); PREP (Preparation); PROC (Process)
 (catalyst for synthesis gas manufg. from **methanol**
reforming)

IT 67-56-1, **Methanol**, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
 (catalyst for synthesis gas manufg. from **methanol**
reforming)

L30 ANSWER 6 OF 6 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1992:8282 CAPLUS

DOCUMENT NUMBER: 116:8282

TITLE: Membrane reactors for dehydrogenation

INVENTOR(S): Imai, Tetsuya; Kuroda, Kennosuke

PATENT ASSIGNEE(S): Mitsubishi Heavy Industries, Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
JP 03217227	A2	19910925	JP 1990-12645	19900124
			JP 1990-12645	

PRIORITY APPLN. INFO.:

19900124

AB The reactor is equipped with a feed inlet, a product outlet, a
 H-removing

device consisting of a porous metal catalyst holder with 0.1-20 .
mu.m pores having a Pd-based H-sepn. membrane with
 thickness $\leq 50 \mu\text{m}$ at least partly on the surface, a catalyst, and
 a heating device placed outside. Thus, SUS 304 powder with av. diam.

1 μm was molded into a pipe (outside diam. 10 mm, inside diam. 8 mm,
 length 500 mm) with av. pore diam. 0.5 μm , metalized with Pd on its
 outer side to 10 μm thickness, filled with a catalyst with av. diam.

1 mm contg. 20% NiO and 80% Al₂O₃; placed in a reactor, and the
 catalyst was

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reduced with H at 500°. Reforming of a 1:3 (mol) CH₄-H₂O mixt. in the membrane reactor at 5 kg/cm² and 500° with Ar as sweep gas proceeded with 95% conversion of CH₄ vs. 24% in the absence of the Pd membrane.

- IC ICM B01J008-02
ICS C07C005-333; C07C011-00; C07C015-46
ICA B01J023-74; C01B003-26; C01B003-38; C01B003-58; C07B061-00
CC 47-3 (Apparatus and Plant Equipment)
Section cross-reference(s): 45, 51
- IT **Reforming**
(steam, of methane, membrane reactors for)
- IT 1314-13-2, Zinc oxide (ZnO), uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst, contg. alumina and calcium oxide and potassium chromate
and potassium sulfate, for dehydrogenation of ethylbenzene, membrane
reactors contg.)
- IT 7778-80-5, Potassium sulfate, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst, contg. alumina and calcium oxide and potassium chromate
and zinc oxide, for dehydrogenation of ethylbenzene, membrane reactors
contg.)
- IT 7789-00-6, Potassium chromate
RL: CAT (Catalyst use); USES (Uses)
(catalyst, contg. alumina and calcium oxide and potassium sulfate
and zinc oxide, for dehydrogenation of ethylbenzene, membrane reactors
contg.)
- IT 1305-78-8, Calcium oxide, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst, contg. alumina and potassium chromate and potassium
sulfate and zinc oxide, for dehydrogenation of ethylbenzene, membrane
reactors contg.)
- IT 1308-38-9, Chromia, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst, contg. alumina, for dehydrogenation of butane, membrane
reactors contg.)
- IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst, contg. alumina, for dehydrogenation of propane, membrane
reactors contg.)
- IT 1313-99-1, Nickel oxide (NiO), uses

RL: CAT (Catalyst use); USES (Uses)
(catalyst, contg. alumina, membrane reactors contg., for steam
reforming of methane)

IT 1344-28-1, Alumina, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst, contg. nickel oxide, membrane reactors contg., for
steam reforming of methane)

IT 7732-18-5, Water, vapor
RL: USES (Uses)
(in reforming of methane, membrane reactors for)

IT 7440-05-3, Palladium, uses 12665-15-5 50941-20-3
RL: USES (Uses)
(metalized on porous catalyst holder, reactors contg., for
dehydrogenation of hydrocarbons)

IT 74-82-8, Methane, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reforming of, by steam, membrane reactors for)

=>